

### **REMARKS**

The Applicants have now had an opportunity to carefully consider the comments set forth in the Office Action mailed March 10, 2004. The recognition of allowable subject matter in **claims 2-5, 7-10, 12-15 and 17-20** is noted with appreciation. Nevertheless, in view of the comments and remarks made herein, amendment, reexamination and reconsideration of the application are respectfully requested.

### **The Office Action**

In the Office Action mailed March 10, 2004:

allowable subject was recognized in **claims 2-5, 7-10, 12-15 and 17-20**; and **claims 1, 6, 11 and 16** were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,633,538 to Tanaka et al. ("Tanaka").

### **The Present Application**

By way of brief review, the present application is directed toward systems and methods for affecting recovery of a network involving a plurality of computing apparatuses with each respective computing apparatus hosting at least one respective service. An exemplary system includes at least one hardware based watchdog timer or control unit coupled with each computing apparatus and at least one software based watchdog timer or control program distributed among at least one of the computing apparatuses. The system responds to a computing apparatus becoming inoperative by affecting a recovery operation. The recovery operation includes distributing the services hosted by the inoperative computing apparatus among operating computer apparatuses and returning the distributed services to the inoperative computing apparatus after the inoperative computing apparatus becomes operative. Preferably the recovery operation is orchestrated by the hardware based watchdog timer or control unit. Typically hardware based watchdog timers or control units are much faster than software based watchdog entities. However, if the hardware based watchdog timer or control unit becomes inoperative or unavailable, the software based watchdog timer or control program orchestrates the recovery operation. This two tier watchdog architecture provides reliability even beyond the ultra high reliability of a hardware based watchdog timer by removing the possibility of a loss of a watchdog services due to a single point of failure. That is, with the two tier watchdog apparatus and method of the present application, a hardware watchdog can fail and (N-1) processing nodes in a

network may fail (where N is the number of nodes in the network) and limited service can still be provided using the remaining operational nodes.

### **The Cited Reference**

In contrast, it is respectfully submitted that the primary reference of the Office Action to Tanaka allegedly discloses a system wherein only a software based watchdog is distributed over a plurality of nodes of a network or cluster of nodes. As pointed out by the Office Action, Tanaka makes reference to a control node **130**. However, it is respectfully submitted that the control of control node **130** is software based. Furthermore, it is respectfully submitted that control node **130** does not actively participate in watchdog or monitoring functions. Nor does control node **130** participate in or orchestrate continuity or recovery operations.

Instead, it is respectfully submitted control node 130 is simply an interface and supervisory device for configuring the master node **110** and slave nodes **120** of the system of Tanaka.

It is noted that when Tanaka refers to an apparatus simply as a “node”, it is a reference to either a master node **110** or a slave node **120** (column 4, lines 48-51). The control node **130** of Tanaka comprises a process unit **131**, a display unit **132** and an input unit **133**. The process unit **131** includes process units such as a resource duplication designation process unit **131A**, a schedule designation process unit **131B**, a node setting process unit **131C**, a node status display/control process unit **131D**, etc.

The resource duplication designation process unit **131A** provides an interface for displaying a resource duplication designation screen on the display unit **132** of the control node **130** in order to duplicate a desired resource from the master node **110** to the slave node **120**, and enabling a user, such as a system manager, to instruct the master node **110** to execute a resource duplication process for a designated slave node.

The schedule designation process unit **131B** provides an interface for displaying a designation screen for a user, such as a system manager, to input a schedule on when and how what job is performed by which node from the display unit **132** of the control node **130**.

A node setting process unit **131C** provides an interface for displaying a node setting screen used for a user, such as a system manager, to decide for each node whether or not to set the node as the master node **110**, and to set up the real IP

address and virtual IP address of the node.

The node status display/control process unit **131D** displays a status as to whether or not each node normally operates, or is represented to operate, on the display unit **132**, and makes modifications, such as the stopping of each node, etc. (column 6, line 54 - column 7, line 42).

In this regard, it is respectfully submitted that the control node **130** of Tanaka is used for system configuration and that only the master node **110** and the slave nodes **120** are involved in node health monitoring. Furthermore, it is respectfully submitted that which node is a master node is merely a choice made by using the node setting process **131C** of the control node **130**. The nodes themselves can be identical except for the software and data they are loaded with.

It is respectfully submitted that Tanaka only discloses software based watchdog timers and does not disclose or suggest a hardware based watchdog timer or control unit or software watchdog timers or control programs that become operative when a hardware based watchdog timer or control unit is inoperative or unavailable.

#### **The Claims are Not Anticipated**

**Claims 1, 6, 11 and 16** were rejected under 35 U.S.C. §102(e) as being anticipated by Tanaka.

In explaining the rejection of **claim 1**, the Office Action asserts that Tanaka discloses at least one control unit; said at least one control unit being substantially embodied in hardware; said at least one control unit being coupled with each said representative computing apparatus in said network. In support of this assertion, the Office Action directs the attention of the Applicants to control node **130** of FIG. 1 and column 4, lines 39-45.

However, **claim 1** has been amended to recite at least one watchdog control unit; said at least one control unit being substantially embodied in hardware and at least one watchdog control program; each respective control program of said at least one control program being substantially embodied in software.

As explained above, it is respectfully submitted that the control node **130** of Tanaka is not a watchdog control unit.

Instead, it is respectfully submitted that the control node **130** of Tanaka is merely a system configuration tool.

Furthermore, it is respectfully submitted that the master node and slave nodes of

Tanaka include software based watchdog timers and do not disclose or suggest the at least one watchdog control unit substantially embodied in hardware disclosed in the present application and recited in **claim 1**.

It is further submitted that if the master node and slave nodes of Tanaka are considered to include hardware based watchdog timers then the system of Tanaka does not disclose or suggest at least one watchdog control program; each respective control program of said at least one control program being substantially embodied in software.

In either case, Tanaka does not include all the elements recited in **claim 1**.

For at least the foregoing reasons, **claim 1**, as well as **claim 6**, which depends therefrom, is unanticipated and is not obvious in light of Tanaka.

In explaining the rejection of **claim 11**, the Office Action again asserts that Tanaka discloses at least one control unit; said at least one control unit being substantially embodied in hardware and at least one control program; each respective control program of said at least one control program being substantially embodied in software.

However, **claim 11** has been amended to recite at least one watchdog control unit; said at least one control unit being substantially embodied in hardware and at least one watchdog control program; each respective control program of said at least one control program being substantially embodied in software.

In this regard, arguments similar to those submitted in support of **claim 1** are submitted in support of **claim 11**. The control unit **130** of Tanaka is not a watchdog control unit and the master and slave nodes of Tanaka include only software based watchdogs. For at least the foregoing reasons, **claim 11** is not anticipated and is not obvious in light of Tanaka.

In explaining the rejection of **claim 16**, the Office Action asserts that Tanaka discloses providing at least one control unit; said at least one control unit being substantially embodied in hardware and providing at least one control program; each respective control program of said at least one control program being substantially embodied in software.

However, **claim 16** has been amended to recite providing at least one watchdog control unit; said at least one control unit being substantially embodied in hardware and providing at least one watchdog control program; each respective control program of said at least one control program being substantially embodied in software. Arguments

similar to those submitted in support of **claim 1** are submitted in support of **claim 16**.

For at least the foregoing reasons, **claim 16** is not anticipated and is not obvious in light of Tanaka.

### Telephone Interview

In the interests of advancing this application to issue the Applicant(s) respectfully request that the Examiner telephone the undersigned to discuss the foregoing or any suggestions that the Examiner may have to place the case in condition for allowance.

### CONCLUSION

**Claims 1-20** remain in the application. For the reasons detailed above, it is respectfully submitted that the claims are now in condition for allowance. An early indication thereof is respectfully requested.

Respectfully submitted,

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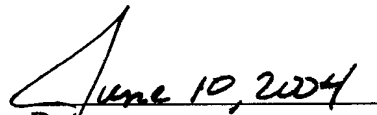
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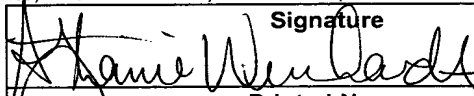
  
Date June 10, 2004

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